



***Fluids and Combustion Facility
Preliminary Design Review***



SRED Ops Requirements Compliance

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Fluids and Combustion Facility Preliminary Design Review



Operations Requirements Compliance

- There are a total of 16 operations requirements listed in the SRED
- FCF will comply with 15 of these requirements
- The one non-compliance is due to ISS capabilities and is beyond the control of the FCF



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Operations Requirements Compliance Summary

| Requirement Number | Requirement Text | Compliance |
|---------------------------|--|-------------------|
| 01 | The FCF Increment Management organization shall provide and schedule PI-team access to FCF simulators that have sufficient fidelity to aid in both development and verification of PI hardware and operations procedures. | Will Comply |
| 02 | The FCF Increment Management organization shall schedule verification activities so that each PI team has time to simulate more than one mission timeline sequence in the flight-like configuration. | Will Comply |
| 03 | Calibration, verification, and functional test data shall be made available to the PI team for at least 90 days following the completion of test activities | Will Comply |
| 04 | Functional performance of facility provided measurement instrumentation integrated with PI team provided hardware shall, typically, be verified in-situ and be traceable to certified reference standards (e.g. temperature, pressure, illumination intensity). As an aspect of this requirement, FCF shall have means to periodically re-verify the functional performance of instruments on-orbit. | Will Comply |
| 05 | The FCF shall routinely monitor primary environmental parameters (i.e. temperature, pressure, humidity, and acceleration) within each FCF rack and provide that data to the PI teams before, during, and after the mission | Comply |
| 06 | The FCF shall routinely provide ancillary ISS data to the PI teams including information on crew activities, maneuvers, docking, altitude, attitude, etc. | Will Comply |



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Operations Requirements Compliance Summary – Continued

| Requirement Number | Requirement Text | Compliance |
|---------------------------|--|-------------------|
| O7 | FCF shall provide a near-real-time data downlink and a near-real-time command uplink, as specified in the SRD, to permit true telescience. . | May not Comply |
| O8 | FCF shall provide reliable capabilities for recording and protecting science data on-orbit. This capability shall include: adequate computer memory or other storage media to record all required data from one data point of each active experiment in a time tagged format. Ability to down-link recorded data, limited only by ISS communications | Comply |
| O9 | The FCF will monitor all essential ISS, FCF, and PI hardware parameters to identify off-normal conditions and to allow the initiation of timely corrective actions that protect the science objectives of operating experiments. In particular, the “quality” of data downlink and command uplink shall be frequently verified. | Comply |
| O10 | The FCF shall provide both local and remotely located PIs with any custom hardware and software that is required to display sequential data from FCF sensors (e.g. time, temperature) in tabular or graphical form, and to perform simple statistical transformations on that data (e.g. curve fitting). | Comply |
| O11 | The FCF shall provide both local and remotely located PIs with any custom hardware and software to display images that are acquired by the FCF. | Will Comply |
| O12 | The FCF shall store on-orbit and subsequently return to the PI team all existing PI team-provided, experiment-specific equipment, samples, and data utilized or produced during operation of the experiment, per formal preflight agreements between the FCF and the PI team. | Comply |



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Operations Requirements Compliance Summary – Continued

| Requirement Number | Requirement Text | Compliance |
|---------------------------|--|-------------------|
| O13 | The FCF will make available to the PI all relevant data generated during Flight operations. | Comply |
| O14 | The FCF shall identify and fill (as possible) gaps in the negotiated data due to communications outages or equipment failures. | Comply |
| O15 | The FCF shall provide access to all negotiated data for at least 90 days following completion of on-orbit operations | Will Comply |
| O16 | FCF shall deliver all negotiated data in hard copied format within 60 days following the completion of on-orbit operations, and FCF shall have one preferred medium and data format for delivery of hard copies. | Comply |